AUGUST 1944

# VIATION The Oldest Samerican Seronautical Salagazine

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The rugged construction of the Vought Corsair enables

it to take severe punishment from enemy guns and still get home. The ability of this fighter to "dish it out" is a famillar story. Navy and Marine pilots also know its ability to "take it."

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ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION



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Revolutionary development meters third in either direction



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\* KOLLSMAN AIRCRAFT INSTRUMENTS



AVIATION, August, 1944



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AVIATEON. Aurent. 1994

PIPER Cub

# Trail Blazing in the Skies

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#### HOW GOODYEAR AIRCRAFT CORPORATION SERVES THE AIRCRAFT INDUSTRY

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- By extending the facilities of Goodyear Research to not the robotics of any design or engiteering problem

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Check these features and you'll see why the proplemanory

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# \*AC POWER SUPPLY SYSTEMS



# Variable Frequency AC for Rectified DC Power

#### Design Check Chart for Eclipse Constant or Variable Frequency Alternators

#### APPLICATION

b' Edgras Alternators are designed to provide a source of either constant or variable frequency for AC or modified DC serves.

P' in conjunction with the recommended Visitings Beguinter and comprounding unit, a controlled AC Present Supply System can be designed to provide for the electrical power requirements

#### PERFORMANCE

9' By intelling Alteresters on constant speed errors, driven by averoff mole engines, a source of assissant frequency in conditable.
9' Recified DC, power can be obtained from wither constant or venotible uponed speerfilm over the reched operating speed range of the Alterestant, Nationaled DC convers in this condication.

# F Detailed specifications are outlined in the accompanying Specification Chert.

#### DESIGN:

P Integral angles, Brahes are specially designed for efficient, long service at high climids P Frentiss type florible terrors drive short

pergrete librication under continuous operating penditions. P Speriod for and subular amature shaft

#### CONTROL

were committee regulation without fischedities code reduce radio interference to a littlewee.

\$6 Bellind the dependable performance of Edgas Alternation should the potent large of CERATYE DROPHERENG—integretation soon regimening working together to produce better opportunities of better ways. This effective team of your service to help solve grant or types service to help solve grant or types service to help solve grant produces.

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BRONZE SUSHINGS & BEARINGS & PRECISION BRONZE BARS



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"controvious supports." there are the some one tool profits-

predicts new tools from the soled After regioning, each curter is further improved by the earlieve "Senerite" hear-year process that increases such hardens and the lengthers cetting his from does to five times. The "Severite" heat treatment cods. you coffeed it is sheet on other of the many wors in which Surveyance gives you move for your regrinding throughout the United Stoles. Check up on the work cutters, retary files, burry, etc. in your afant now, for best service, send them to the Severance aftest reasons you for a factory requireding job.

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AVIATION, Aspect, 1946



New Hydraulic Winer Motor

WEIGHS 1 POUND, SMALL, POWERFUL, EASY TO INSTALL

A complete motive unit, easily total into the airplane hydrosite system, this moder protects usingle source that dependent of similarity to the source field, coursed or compound current glasses. The moder has high terror, promitting a blade season up to 660 etches are whetches the product of the services of similarity or and the services of the force are used to piecewing and protecting the subject new sensity by the piecewing and protecting the subject new sensity by the C. S. children and only most of the force and fire-re-

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10N, Asput, 1946

AVIATION, August, 1944

# DEPENDABLE HEATING

THESE light, wright heaters, designed specifically for signify by engineers with consistency in combustion and besting problens, offer the highest degree of dependability. They light quickly and easily at temperasures down to "th" below year, furnish fast

air, or an auxillary blower can be provided, The illustrations shown here are from the new Engineering Specification Bulletin Form 1.44 Winter for your come It describes the various models of bearers now in mendaction for installation in military aircraft.

Surface Combination Tolera L O













# for Every Aircraft Need



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2 improves sweeter qualities. The process

by which the tensile strength of the shark is increased in no way invasirs the sways ability

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ATTATION, Augus, 1944

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# "NEITHER TOO HOT

# NOR TOO COLD"

Ever think of an engine's cowl flant as its "horse blankes"? One surrounding reprogrames is controlled so that it's arither too hor nor too cold. So, just so the blanket keeps the temperature soons secret for Dobbie, the could fare of the Lockhood Venues keen the temperature of its 4600 h. n. team of twin engines properly cooled.

Four Dumore Aeromotors actuare the Ventura's cowl flags, correctly controlling the amount of cooling sir circulated according to the varying requirements of operating conditions. Keeping engine temperature within safety limits maintains the performance efficiency of the plane's power plant - a fundamental

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efficiency most favorable strengthers wright ratio and minimum service requirements Accompany design incorporates provision for operation at altitudes up to 40,000 feet and over a removerature range of from -65° to 160° F. The full, interestion story of Dumore Aeromotors is given in the Motor Catalog. Write for a copy today.

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#### MODEL 1003-263 COWL FLAP HOTOR

The Versian's cord flags (and of cooler flags) are operated by a



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ATTATION, Aspen, 1844

AVIATION, ADDRESS 1995

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with the

FUEL PUMP

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Lower Unit Costs and Increased Output Result from Carpenter Matched Tool Steels

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THE CARPENTER STEEL COMPANY THE CARPENTER STREET, Reading, Pa. 128 W. Bern Street, Reading, Pa.

## Tool Steel Selection Problem

PRODUCTION BOTTLENECK BROKEN



# BREAKAGE ELIMINATED

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# TOOL LIFE UP 66%

Confidence as scheing used problems with Corporate Membed Tool Seeds increased with senders and assigned a warsh far improved problements on other jobs. Bigh, spaid result had been used for a bartalising peach. The inferior section in the Corporate Membed Control of the Corporate Membed Seeds (Member 2004) for himselfter senders (Member 2004).





Carpenter MATCHED ## TOOL STEELS

#### This Is The Accessible Head of A HUCK BLIND RIVET



PROPERLY FORMED The use of Shark Blind Bloom reduces help

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Sended that find there are not probable in 1/9", 2/20" and 2/10" characters with Article Service (N) Sender Senerated

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ALSO PRODUCED BY HUCK Hart Blad Boyer Blads, which do not consumered All Types of Solid Connectional About Born of Abouts Sirve and Seal Mond. where the officers in exemples arrive is once. iffed, in which case a tennal aurior can be mainly produced on the nin and by one of

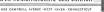
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Specialists in Aircraft Structus Pracesus

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AVIATION, Aures, 1946





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ATIATION, Asymp. 1864



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This gare ship, consolved by TWA..., but I be table such ship, consolved by TWA..., but I be table such a ship of the ship of

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MANUFACTURERS OF FEECISION PARTS AND EQUIPMENT FOR THE AUTOMOTIVE ... AIRCRAFT BAILWAY ... MACUTINE ... PLECTEC REFERDERATION ... BADIO AND OTHER INDUSTRIES ATTATION, August, 1944 ON AND OFF 1.034,827 TIMES ELECTRIC DRILL Every Original Revolving Part Still Functioning Smoothly After 18 Months CAROPATORY TEST OFFICE Independent Proposate Stat Co BANK IARORATORY THE ASSOCIA . DRILLS . ...... \* 54965 . MAT SETTERS







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Because the condensation of all measures could street aircraft cogines can cause rust within 48 hours, it is essential that engines be given dependable posternon against this danger.

One of the ocustomeling rost preventires developed for this puspose is step. Brust B—a product of Urion Coll Gençany, Stop Bust II is being which and mechanism II is being which Goost are craft companies in processing onmines for storage and hipmens. It adheres to metal for prolonged reviews underse internal surfaces

against comosion. It will not dry
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may be placed in service stranchandy walkness special cleaning or
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Stop Rust B meen specification AN-VV-C-576n and is used in accordance with another inflasty instructions governing processing of engines.

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Remember? Stop Russ B will sade guide eggans from russ and comission, keep engines down postuminated in transfellar operation.

#### STOP RUST B



ATTATION, August, 1844

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When one thousandth at on toch occunity is a contray requirement—there is a surgate few error. That's why Dudder Parners Works' lifty years experience in designing and building patterns arises to designing and building patterns arises to the chains of leading atternst notions the country over: "Dudder's "apprises with solution, structural design and practical individuals are encurrences of contrags that are restal-

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1710N Apres 1864

WHAT HAPPENS TO STEEL WHEN NUT MEETS BOLT? Blow them up 100 times in the Metalgraph and see why some fasteners fail





To the miled eye, note and belts are just note and belts. To be seen, surface defects are sometimes apparent, but they are could detected. What homeous to the crassilar structure of

leak, and their broken in test, is consisting the again . . . and tembly important. This is yet one of the many processions our

nortellargies and engineers take to insure reportative performance . . . se extende of the meante





Host reward of they start, on larged 1,000 canno.

THE NATIONAL SCREW & MFG. CO., CLEVELAND 4, O.

AVIATION, August, 25



Youli Americans to the month of all Atled Nations to the millions B.38 is a new and posserful friend. The thursday of its method Wright engines and the long, enseeful system of its wines are a thefine remader that now more than ever the days of the Assa

FRIEND AND

To the perpetuators of this terrible world conflict - this same 3:39 is a frightening, releation for. No spot on the face of this earth is beyond its reach . . . no power-can present it from refeasing its lead of destruction exactly where and when it wasts. In these quarters the B-29 is far from popular.

The men and women of CECO are proud and hency that the carburetors and fael wereps they missafacture are a part of Ameri-

ca's newest and greatest werplane. This is their most direct contribution to Victory. PROTEK PLUGS CHANDLER-EVANS CORPORATION SONNECTION SUSTA



AVIATION, Assess, 1944.



#### How To Keen Surface Grinding "Out of the Red" When resolvetion routs rall for approprial award temperature owns and newspaper alan

writing production costs call any sugmental

PRACTIONAL GRADING ... three degrees of bandones to each sends tools ad This extra margin of choice enables you to "At the grade to the grind" for the fastest, coolest cutting ... savering that perfect halcan mean the difference between being "in

officing origin the extra know-how that Literature about Bay State Segments is

BAY STATE ARRASIVE PRODUCTS CO. WISTADAD HASS



BLUE FLASH GRINDING WHEELS ..... COOL

AND GATTER AND STALL STATES ON THE STATES OF THE STATES ON PRETABLE BRADONO WHEELS (C) MODELES MEETLS T AND POINTS & BEINGHES MEETLS (C)



# WE CAN'T BUY 'EM - SO WE BUILD 'EM

Cannon Quality Control request such as it is it reconnects done sciences. So so men on medicals

we make our own.

That's doing at the hard way big it's worth it: For now

we have a tool and the manufacturing place second to need in precision, accuracy and general excellence of produce.

It's an aspasiancian of shalled tool realism, none with less than seven

the factor materials it is a big plots with a capacity many series are ordered; needed. But this production margor means better sook, more efficient machines, resolutions on local before exhaustion and thus, of course, correspond

CANNON FLECTRIC





10N, August, 1864





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or seculy randitions as may fear All moving helic and gons one completely madreed. Ask year loops declar or wron for conting understates

LOGAN ENGINEER HOLDER

(HICAGE 18, ILLINOIS

AVIATION, Appen. 1944

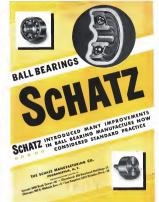


Concentrated effort on production of gas powered fork trucks for our Armed Forces curtailed the manufacture of Clark Flortele Fook Toucks for a short time-

Increased productive canacity enables us to again serve the needs of Industry for dependable and proven electric fork trucks,

CLARK ENGINEERED and CLARK BUILT H new need no electric lock truck VOW, phone, wire or write-





ATLATION, Argest, 1864.

## The CONE AUTOMATIC MACHINE COMPANY OD THINGS AHEAD

Vikestian chiefs, conder to those

The mon rootal tantahan un-

A noted aviation engineer and A new heat-redictors allow is no-Firegrad cotton betting it now A new loan is being made which

It is reported that . . . . . . A plant has been built for process. ing large quantities of the lowly withward. The floor is a good with stalley and later extracted from the

New decision care howe a terri-A man-filled face, now used to detaequite trimes, will explode a charge

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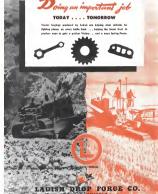
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Calcorors of Nylvo, while you

A new robber shorting perfected

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ATLATION, Aspet, 1946



M SCYPLINITE Process of manofservery is authoraly rafe and cond FARROWTEST-chemost cascion faccous rebin carperers it. Because of its high segsitivity and seconds: this electronic and reseals damaging imperfections in taking --- even small favor which would slip by under usual inspection

or ordinary testing methods. This is the not view EVERY length of Republic ILICYRU-NITE Aircraft Tables before shipment to assure users that they are current the blobust commercial quality obtainable.

to collision to the enforce destrict arrayed, ELECTRUNITE also constructs uniform in wall thickstrength, weight, ductility and

fine surface. ELECTRUNITY Tables mess Air Torces. The Barrow of Arronautics, U. S. Navy, The Civil

Associative Administrations and The Aeronautical Material Specificutions (AMS) of The Society of is surded sizes in curbon allow and statebess seed. Write for

REPUBLIC STEEL CORPORATION









Standardization and













On these 3 things on they are done at ADEL and the personum afficiency, performance. On this page is a partial showing of the big ADEL family of AN

ADEL









# WHEN CLIFFORD SUBTRACTS COPPER AND ADDS ALUMINUM

SAVING = /3/

To sove only 100 pounds of weight, heavy U. R. benches pare for without consenting points. No encoder that U. S. Army An Termon suggester that the support of the support o

Nicology over weight inn't the only gain when CHEGOG subtracts copper and adds stansized Greater redirates to heat and pressure is also obtained, for aluminary allow braining oraterial stands 2 to 8 tines higher temperatures and several times greater pressure than soft softer

stands 2 to 8 times higher tengeratures a several times greater pressure than soft sol ... and the aluminum alloy is heat-treate whereas copper gradually assessis and weak under continued high temperatures. CLIFFORD MANUFACTURING CO.

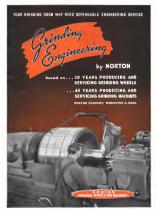


HYDDON" BELLOWS

OIL COOLERS AND
COOLANT RADIATORS
Same 2/3 The Weight

INDUSTRY'S FIRST HYDRAULICALLY-FORMED BILLOWS

AVIATION, Aures, 1944





In the Junale ... LOW MOISTURE ABSORPTION COUNTS

> It is the family that gives both the mentionical and electrical pure of explores their security tests. In these trees, in the months of larger hand please, Ferming has come through with future cross, Frentiers does equally well as the cold day abidispipers. This and the pure constanting of half weight Chapter growing 1-301 with high obseroth accounts for the ever relationship of half weight Chapter Commiss excepted 71 are never in securiors.

Avoidous use of the meaborist operated to more used more parts of pieces. After the west park my it will be used in decoupling tensions the fire whereas of passenger priories.

4428 SPRING GROVE AVE., CINCINNATE 32, 0.

THE FORMICA INSULATION COMPANY FORMICA

VINCO CORPORATION, 8865 SCHAFFER HIGHWAY, DETROIT 27, MICH MILLIONTHS OF AN INCH FOR SALE BY

CLEVELAND

NEW YORK

SALES OFFICES-

# Forty-three million in one morning sky

W.A. mighty core filled the six, Beinrich looked up from his goord post and saw the beginning of the end for the Naze-G. L. Joe consed from an uncrains bost at the lorgest sunbrella ever subset. The great six exemple, which seen and verses of America's acressly indexing had sent off the ansemble lines over finers and better than the positionts had

through possible, was in necket.

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the crucial takenal?

Here is AFCO, we would picture the handerds of thomseads of fittings which we have sent on their racy to sidelin creating the world's most powerful are arm. Small parts, time. Res. for our opinion, lig enough in importance to deserve the care and prentite that only modern mechanics and hilled hands are assured as a plant forward one hander our occurst to

sirerelt fittings production.

You think that way about fittings and know you're right
...particularly when you see facty-three militim in one





FITTINGS OF QUALITY FOR PLANES OF WAR AND PEACE The Aircraft Fitting Company + 1400 Cost 20th Street + Claveland IA, Onto





Remember due goest serial photo which eccently appeared in the newspapers<sup>2</sup>
And other neval above above go the destruction raised on energy functionies
and slope?
This photo, as probably were the others, was made with a Furchild conten-

this flamous content content. For each process of the content were used contenting for exploring, theretay, supposing and other near whose convene processon is requested... at some for each work of the contenting content

It is from such an organization . process and leaders as the more eneming breach of the photographic sciences ... that nor consistly would expect the commanding camera developments in the day to come.

for producing these orely precision entiress.







# GI's ... by proxy

Whether it's forty depress below in Abaka or new baseled and see in the sun at leas, the seekassal resentatives of Bell Assenth's field exsual help keep discussed of Assecfring ...and fighting as the for co-

The front technical mission seat to Bosses by an American standardism consisted of the Marchal revocation and capaciton. The diff Archal revocation and capaciton These ones governable understand reference to a soft other engagement of forces and present destination of officers and present determined and manuscriping and manuscriping the thousands of Bridger phases on the Engineer fusion In rooms they brought back the band have been forced from the contraction of the contraction of the providing of Astrochem in action to the contraction of the contraction of

Theris is a designous file. They are credited GF view below as representageant in belong the Army Art Forces and our Alliston keep's in flows. Here is Amersia, they serve man communds of the Army Art Forces-shriving a solidar's life on the California deliver to it the owning of Physics—a order so leave here is well used a mode on leave their owward useder acoust own conditions. Some of three Bell foreneesings are

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And when the new Bell beliespier becomes avoidable for ground war, the covies department will add the best Bell Accords development to the activities. If Bell Accords Corporation



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## THAT OUR COUNTRY MIGHT Out-Devise THE ENEMY



## Small example of a BIG PROGRAM

registery reached and property of a secure of errains mend, economy of asight and a redoction as one. There apportung advantages necessar from

When the year started, Carolin-Wright Instituted the list, but the recorder has been brandened to include

the whole field of married research. scars more are on the horizon. Not only will they in-

inappareted at the outset of war cost; but, in days to come, will make possible greater neededs for the Carties Transports that will fir the Division Buffelo Cobsober St Loan Louisville



bow you can get it:

# Right Relay TAKE THESE TWO STEPS

The right relay, of course, is the one which will exactly fit your needs, and give you the longest, most dependable service at lowest cost. Here's

v. Welse for the Assessment Plantale carelog. It lies over forty basic types of relays, providing every combinetion around for modern electrical control. All technical facts are clearly tabulated for your guidance.

2. If you want belo in applying this information to your problem, call in our field engineer. He will be relad to put his experience to work for you.

Send today for your copy of the cutslog-or simply ask our field engineer to bring one over.



ATIATION, Asput, 1964



READY for hard continuous work with

# Porus - Krome\*



This carries ordinder, processed with Popula-Known, is ready for bard continuous work that would rum ordinary oviendors and come a workstapped for reports Perces Known is pure choosens, which is mby the You doe Horst scores that produces tive poees to hold ad and feed it back as peopled

for habitations of collector surfaces.

been treated with Popus-Knoon lost 4 to 20 thuce as long as ordinary exhibitors. Hings has is reduced to nought. The Missource of Bourse Known made a said

combination and steam engines, and progressive carme hubbers are electrics to make use of its advantages in their improved pracetime ranner. May we tell you how PORCO KNOWS will add to the reliability of your enriess?

PORUS - KROME Good for the Life of your Engines



VAN DER HORST CORPORATION OF AMERICA CHARLES IN COMM

AVIATION, Annual 1944





I'm the first data or was, the PBYs and their gallier curve performed the 'impossible'------when iting respect printings the easiny grabby's problem . . . of great valueurs of best could be had without both and weaths and beary blowers. And to house Wind delicated a Tanana See .the first production specification of between combin-

siccraft industry. After 15 months' development, a Wagner was able to delege application models of two approach fough Wind become for the TRY. FIRST IN EXPERIENCE, FIRST IN PRODUC



West Coast Office: Stream-Worner Assouth Heater Englauring and Service

AVIATION, August, 1844

PWYODAY-- for some of the loans and arcsaus heatand neigh in secretary South Wind in he strader. or, weboca blower or eaging connection. every climate and condition of every handsfront

nauther Seach Wind "Sea" - the first Fact Mesering Control-that steps up first flow and Ange the Anney its size-just over that of an ordinary waste-basket.

If you have a bearing problem, look to found

And yours make to this Model 911 South Wind in

Heating HATE DIVINOR STRAET WARNE CORPORATION, CHEAGO H, KIL 1272 Finderind Boulevard, West Last Awardes, Galifornia.

AVIATION, Assest, 1886



MADE AT THE OBSISHATORS OF THE KAUSMAN PROCESS FOR GREATER STRENGTH AND ACCURACY

ATTATION, Assets, 1944



### INTERLOCKING Performance

Working together as classly as the nivigator and gibbt of a bomber, "Greatfield" Taps and Gages are a production team, cetting and checking billions of serow threads that hold together the interchangeable sentla parts of modern arraneses. It is a team that serut work with the greatest precioins—and search.

"Greenfield" is a leading manufacturer of both production tops and precision gages. As a leavy, fisce sock have set the challenge of an unprecedented worker dereatd. A force mallisted and perfected for var production, "Greenfield" tops and Gages will centime to help American leadarty win its peoperties help American industry win its peoperties better of creditation on well.

FOR DUTBELOCKING PRESCRIPTION SPECIES COMPANIES THAT AND OLOS



AVEATION, Asput, 1944



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HARRISON RADIATOR DIVISON OF GENERAL MOTORS

HAR/RI/SON

AVIATION, Assul 1844







### Need a Motor that can lift 500 times its own weight?

These electric motor weight only a passed.

But cases power is pucked in that one powed of motor than has over been before.

With Leav genering it can handle a quarter-ton load.

And it has to be ready to do that for an instant.

Because this motor moves control flaps, and hencer shatters on warphanes. And six posmers moves high at the spend these ships by. On sircesft, even the weight of a cost of point has to be enablered. So this motor had to be

There's little even in an elephane. So it had to be untill.

Designing it success starting from sensich.
There was no precedent for this kind of se-

You seed severe meed a sunser like this, it may not more than you might must be prelated by your meeting that the pretained that th





So if you have a footening problem van how these red-collered Eura

ready to council with you and rec-Olpper sizes 1906, Ther are on meters, woman, where and court Particularly timesyring are the fasten the covers for impection



by railflore in all kinds of alcolunes. Electic Step Note look tight and feet without any envillary devices. There's no time wasted in fusion to get them off and back on acris. They look because of the elactic col-

in 60 hours - 2,100 man-hours a

to between the holt threads, It's connerrand tiebs. The not can't turn. It can't wiggle. It can't slinks loons. And you can take it off small

AVIATION, August, 1944





NOTHING BABIES YOUR DASSENGERS ...



Seating people conformbly is year business.

of shape. And all those ar-cells breathe. They

Former racket better sense to maintenance menmolded, suggested unit. Fearner has been est-

right eway. It a strictly military, that you can put holstery fabric Molors structure refines reserved

ANTHE CONTROLLE TO A SETTER BAY OF LIFE by FIFE STONE



#### HOT ... but not bothered

And when we say "bod", we meen 139" in the shade , , , and of course, much hatter mostly the gashies engine of a Homelets Part. A large tan on the Hywhort sends a constant has at our over the evaluator, blackly direct that air series the first of the absurance evilinder . . . prevideg manguage cocking: Complete labrication is a fresh, clean like of cal carries the crank-care with each aveolation. or cold . . . for oil second with a moleculary to a control larger at ealst From Levillery tropped heat down to naloness are the temperatures.







ses sades they past through lifetime next closely durifcurry actual combut acceptates - "everything had sudependshiften? He this shot must an eura value on The A-B multiple-check mindals of adequify makes

A-P Built Hydraulic Sequence Valve One of many Hydroulis Aircraft

is the route of wide knowledge and experience in precision valves of every type. It's pre-pasod of performance to thereart that other manufactures love are relevant them to vital alternit mens. And his one good reason for the separatory quakty, occuracy and dependability



Maanwhile . . . Check the coupes for YOUR WHOMANG MODRACIS COMPANY Safe Marth Street Second Street

Pre-Proved for Combat DEPENDABILITY ...

Strateging, Look are copy at your "Account Control

Pur A.P. parement-production facilities, manufacturing

less the may have. Perhant my can help with an

copy of new Aircreft Control Cotales.





#### R.P.M. and H.P. alone won't do!

If you are planning a new product that will require a special electric motor in its construction, our engineering development department will welcome the concensity of working with your

For over farty years we have been developing special mature for special jobs— and during the recent years namy austranding improvements in electric motor design, construction and performance have been created by as—motors that ere playing an

Many of these new motor developments will be available for general industrial use after final victory.

Machinery dealers as lower coronal to use a standard

meter for a special job—it is much more economical and efficient to obtain a motor with assertly the electrical and succhanical thereoterwise required to perform a specific job than it is to try to observe mp a standard "abolf" mater at do the job.

No matter what your electric matter requirements are we will velocine the appearantly of serving you — your reeds will receive my need among a stration

a cony any.





#### With Nearly 2 MILLION BITES per minute They Cut Sheet Steel Like Butter

With the lot and product, which makes now early per mineau fractions are not produced, which makes the cutting of mind send aboves up to \$1 kills and not for inversa materials of process tributed or \$10.5 with these materials the function emerged termed or \$10.5 with these materials the function emerged to the control, \$10.0 kills are reserved to the support of the control, \$10.0 kills are promised as and bandwise of the control \$10.0 kills are producted as of the mental working function for some of the tributed and perfectly soft, the terme minimizes are instanced quantitively the high speed speeds by the entitlement of the high speed about some of which the product of the state of the soft substanced in the soft minimized of the soft should be supported function state of the control and the soft should be supported function state of the control and the soft should be supported function state of the control and the soft should be supported function state of the control and the soft should be supported function state of the control and the soft should be supported function state.

tor belieful, "BIOSI SPEED MRTAL CUTTING BAND SAWE."

OTHER TANNEWITZ PRODUCTION EXPEDITES: FOUNDRY BAND SAWS—
longs and semble speed for outling of gates and draw of entiring of any size or would 
DEAWS— for londs and enable sweet; this filling and pickline. Where the beliefuls.

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A major suppliar of 100 actors gasoline to the Army, Navy, and United Nations air forces

THERMOTITE

Though a part worthston more on in six of declar non-

colum. And it is all due to Thermotor' and Sherron-

Williams Pallet" (Bor.Doord Fabric), to unbestable

With Thermonte<sup>a</sup>, you can lorget the use of thomess

Became no thinners are used, dones applied by the

Thermatics Process are thinned down, and thinned our.

No blessich have "out" their curvetag power. Hessit: They

healed to six count filters with shows courts . . . save bours of

dope application. It is now to use to many alcoraft plants.

Thermodus is a sected and around muscles weethed of

tions and labor as not as volumes of materials!

We will chally send you a hat of succes' respect

TWO GREAT NAMES IN







Sherwin, Williams, Formula No. 70110, Succification ment specifications, why at Sherway-Williams No. 70110 Aircraft Power in such extensive use? Assesse Graphte

Surpain, Williams ZINC



. . . aspecier quality that gives dependable results. Allows 300% Reduction? Dries in 5 Microtes! Take subsetion. The olse makin in Shorely Williams. Zine Chromate Primer allows the maximum permicable refaction with the minimum densor of "kirking-out" when used in a properly regulated dip tank. Plus quality minutes . . . saves time and treable, below here production Surpin-Williams Zine Chemete Prince office the maximum in corrector substition according and according America's leading since of release profes Shoulder, Williams Zinc Chromate Printer to say other on the harts of quality slone. This better than occupied monfession makes not only rives Sharnin-Williams Zine Charmete Disease recession newforenesses but also greater consumy in use.

extra serviner in time and labor. Thomastict Sheroda, Williams and Sherwin-Williams Zine Chemate Primer. There will be absolutely no obligaten, Address The Sherein.

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possible edifficial types will be edifed to local stocks to make a complete law of Quakty Controlled
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the sames \$10 m the senson below send without obligating you in cory sear,

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ELECTRONIC TURES ACTIONS ATTATION, Aspest, 7844

#### Heli-Coil Inserts MAKE ALUMINUM TAPPED THREADS Wear Like Iron!



"Mali Coal" trees Dreed to note more the expendence of stead on where they are most independed to wannie heles topped for threshed

were, these buests are impelled in below innered for the American No. Then, when the halding screw or stud-

is reserved, its entire wearing oction is assembly is protected against sensor The wide assessment of "Heb-Call"

doy's ten year of light matels -- wave coasts of their unleared uncluders hole mated mate "Meli Car" leastly Send for decaded breesture today NA COUNTY STORM WITH THE



Heli-Coil INSERTS

INSTALLATIONS IN ARMY, MAY





AVEATAON, August, 1944

You're behind the times if you den't
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process where the flowing medium

or controlled Popus is secular in Dissel

ending injectors, habricating systems,

A rew resout meets for running, speatness, viscousting, flaw Cantral, flame Arresters, Venit and Breathers in the book you'll get the lost-tole recovery systems, bed systems for the state of the recovery systems and the state of the state

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MORAINE PRODUCTS
DIVISION OF
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material and its functions. Send for

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# Precision — THE DISTINGUISHING QUALITY OF SOUTH REND LATHES

It is for their high pecision that South-Berd Luthers are heat known. Those hadpendable accounty has made them thru choice for the most executing work in hanries of emercial way production plants. Finish turning and horing operations or eiten performed with such constants that subsequent granking, heating, or lapping

In war production, there is no place for equipment that can not hold required toderances or deliver maximum output. Investigate the possibilities of South Bend Larbes for handling your execting jobs with restate efficiency. With there, was will find is easier to mountain precision tolerances on technoon and production operations. POST-WAR PRIORITY PLAN

POST-WAR PRIORITY PLAN To those who censor qualify for x wen-turn foreig, Storth Bend Lathe Works offers a grannal Post-Wise Private Plex. Yes can place year for some for any South Bend Lathe. No che will use down payment to required. We add





LATH SUIGHTS FOR 37 YEARS - SOUTH SEMP 30, INCLUMA



#### OK'D BY X-RAY----

Theoretical of rend and the confirm ore used in the exceptioning of Eighter and transport planes. To be already they must combine maximan stressts and minimum waists. Cartiers for bodyantic porture. conference, and fubrication systems must also be all light.

To make over that all about senters folds there because a service meets, U.S. plane melves have exclused were an imperior than rate: 1) on a check on pilet continue it provides a grephic guide to the need for althor a change in dusion, connection of fruits foundsy technique, or as improvement in the pattern or die . . . 2) After a satisfactory costing In declared, blob-record warm units because conduction to become that tes-flight quelity is mainteled in every costing.

There is manifolds a complete fire of the teduction V. Parc Hairy in a wide variety of types to meet every circust insunction used. For full information on to solich unit will best most your perforder regularments write or wire tadoy to Denastment NES



INVASION COAST?



rallographic resminstion to determine

such corrupt dependship secure for the solution of difficult problems of designsor, former, welding and fibricating these metals. This accounts for the fact that such a later proportion of the war places new descriptor. Tomers

AVIATION, Asset 1846

Solis's experienced staff of specialists is

available to consult with other compaof stupless steel, expecially where corrotion are involved. Address curemunications to War Service Division.



COMPANY SAN CIECO 12 GALOR DES MOINES

Woldes Truez: presents a significant advance in retaining rings It served or contracts without distortion; always retaining its perfectly fitting giroular contour.





On request, we will duffy furnish semples and full data for your tests,







THIRD WORLD WAR?

Many of their now wear empty deems, or bandages where their eyes were. And a thousand They couldn't hear it. In the man of that terredo, as they fought repeats ... and what will we get out of it hat . how the fast own we marks . The next one will be appoint . . absorb rowing the ready for . . . and hearly years from new, brother ... the Third World War in elevators, on the street, in plush shairs that let you down easy. In columns

They were at Terewo.

When is the matter with self. Can't we at home at least go into peace with some sperk of their councils and determination that this wer is not smather markery. En to now man to mubble or neferote the who feels to do the server And let each of us do everything humanly possible to help win this war segren . . .

buy Wer Bendy-gue blood boycett the blook merket . . . and plan about Today, the explanary of the machine tool industry can greatly help the past-way planners of appearance and business monogement, One of these is a Bryont man . . .

ANT CHUCKING GRINDER COMPANY PROBLEM AND ALL

AVEATION, Asset, 1844

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of American planes in every task of hattle and temporal Aviation magnetus carry on from sea level to 7 miles up - in six temperatures. that vary from +150° to -70°, in a matter of minutes. Storting athenings are alones off the second faster. And enables fuel injection equipment adds another notch to American plane superiority.

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#### THE NATIONAL DEBT-

and Your Postwar Job

the problem created by our friehtening pub-Coming upon the keels of a minera tensear depression, thus wor has once more made it clear to us that the steepath of our country This is a two hundred hillion dellar war. descends more our ability and willingness to It affects the lives of every one of us. At the produce. Until the world conflict relined end of this war, the public debt of the United States will be at least ten times the the despession we saw what failure to use

country potentially as nob as ours The stark geality of war finally shocked us out of our aconomic letherer. The necessity of supplying our Armed Forces with almost unlimited quantities of goods unleashed our inventive senius and exceled to us our mal capacity to produce. It indicated what our standard of living might be at, in time of peace, we used our full productive canacity. Today we are producing more than all the other nations combined, half seain as much as in 1940. Today our production is insuring victory to our lighting men.

our productive cameity can do - even to a

But what of the future? Alsendy our national debt has mached estronomical perspections, and it is going harlier. The depression years' fear of insecusity that all but paralyzed our spirit of enterprise, our inventive senius, and our natural instinct for examples, appears likely to return promptly if industrial activity again is curtailed for long because of unwise public

This war is beene fought to make men free But our economy estated be kept free through military conquest alone, There is another responsibility which we on the home front cannot avoid any more than we can build walk around our future. That is

turnty-fee billion dollars that it was at the end of the first World War. It will be almost twice the resent annual national income of the country. The interest charge slone will be about 4 per cent of the national income. If the burden were speed evenly, interest alone would take at least \$80.00 of rorm worker's income per year or approximately \$1.60 out of each and every weekly pay Some people fear that the heavy taxes re-

coviered by the debt wall keep the country near by obstructing employment and limitmg the output of goods. Others believe that the size of the debt

does not matter because we own it to ourselves. They reason that if A is taxed \$100 to per \$100 interest to B, A has \$100 less to spend and B has \$100 more, but both together have the same amount. They, therefore, hold that the demand for goods and the volume of employment remain unchanged. Which view is correct? Is our huse debt bound to be a crushing

burden which limits employment and lowers the nation's standard of living or will it simply redistribute income? May the publie debt under certain conditions even be used to bein increase employment and raise our living standards?

Most people, tich and poer alike, find it difficult to believe that the sational debt "just doesn't matter." They know that the interest above on this bage debt will be almost equal to the total amount of taxes ever raised before by the government for all purposes in any peacetime year. They find it additional to follow the kind of reasoning that suggests increasing the already meanment debt year by year in order to maintain full production and employment. They fall to produce the production and employment. They fall to be how this "debt raising" can one indefi-

On the other hand, the records show that other nations have more than once successfully managed even greater debt bundens than will confront the United States after the present war. The interest on the British debt after the Nanoleonic Wire use nearly 8 per cent of the national income, and after the first World War was over 7 ner cent. But despite began taxes and some unfortunate mistakes in compounic policy (such as postoring the prowar pound), per capita real in come in Great Britain rose about 31 per cent between 1920 and 1929. In fact, it rose as rapidly as it did in the United States. The world depression was far less severe in Britain than it was in the United States; and by 1936, when industrial production still was 6 per cent below 1929 in the United States it nas nearly 16 ner cent above 1020 in Britain Britain's lactvy debt burden proved less of a

handicup to her during the depression than our weak bunking system dud to us. Whether the debt becomes a crushing burden or whether we use it to further our progress depends upon who holds the debt and how the moree it raised to may the in-

terest.

Here are the important possibilities:

It the experiment file government, including the frames to othe deck, not not linguily by heavy tunes upon bein men positio—i.e., by takes upon polygrang—than they well induce conjulyment, copyet, and cur standard of being, regardless of who helds the delst, belowy takes an pushed present centerprise from expending current operators or constanting the copyets of the relate, social that

prospects for profit scens certain and the prospects for last are also. Hence the jobs that waglet be elevated to take advantage of leng-chances who are cone into other core, and the country as a whole will be pover.

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coce, and this country is a whole will be power.

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their savings in jub-giving enterprise rather than to them in title each.

But what is the situation today?

Today, non-banking corporations own nearly half of the Federal debt, commercial banks about one-fourth, and individuals less than one-fourth. Not more, and probably less, than one-tenth of the debt is held by persons earning less than \$5,000—although these persons receive three-fourths of

income.

Today, about half of the revenues of the Federal government come largely from taxes which must be regarded as texnes upon the creation of new jobs. If these conditions continue, we may be sue that the debt will be a disastrous obstacle to a rising debt will be a disastrous obstacle to a rising

standard of living after the war.

What can be done to change this situa-

To begin with, vigorous steps should be taken to get much more of the debt into the kends of individuals, particularly of those in the small-income group. During the last three upon the incomes of individuals after torse have exceeded the number of continuer goods by \$74.2 billion. In other words, individuals have been connelled, by the sheer scarcity of goods, to save over \$74 billion Of this amount only \$27.4 billion or 37 cents out of every dollar, has gone into govcomment bonds. Indeed, individuals have saved more in the form of cash and bank denceits then in the form of maximument bonds. The sale of war bonds to individuals was most disappointing in the recent drive. It was so discrepainting in the recent cave. favor a morial drive for individuals only. to be scheduled before the next general drive. During 1944, when the supplies of civilian goods are severely restricted and when the fighting is at its climay, the Treatury will have its best opportunity to persuade individuals to buy more bonds. This opportunity should not be lost. An increase of at least twenty-five billion should be the goal for the next year. Every citizen should be made to understand that by buying war bonds now. he is not only beloing to win the war, he is

beloing to make possible a more prospernus and stable America after the war The effects to sell bends to individuals should be vigorously continued throughout the shift from war production to civilian production. During this period, corporations which, up to now, have been the largest buyers of government bonds, will need all their depreciation allowances and undistributed profits to pay for new equipment, and to restore their own dealers' inventories. The government, however, will still have bron bills to settle and will need to sell as many bonds as it can for some months after the end of hostilities, During this period, the demand for most types of goods is likely to exceed the immediate productive capacity A nation whose expenses are as large as those of the United States will be after the war must be sure that its tax system provides incentives, not penalties, for increasing production and employment.

duction and employment Should the debt be repaid? Some people fear that any reduction of the debt would have a deflationary effect and cause unemby Mr. Morgenthau recently: "We have a his public debt that must be paid off, and the quicker we do that the better " Both of these views are extreme Removement of part of the debt during a period of depression would increase unramployment. Every period of high prosperity, however, would give the envergence an operaturity to pay off part of the debt without limiting employment. During these periods of prosperity, business corporations will sell government bonds in order to buy equipment; and many individuals will redoom war savings bonds in order to numbers houses, automobiles, and other goods. If the government budget runs a surplus during periods of high prosperity, and if this surobus is used to retire some of the bonds sold by compositions or redormed by

individuals, the country will be protected

against a disorderly and speculative rise in

prices. Thus, reduction of the debt can be

made a device for stabilizing our economy

There are two other reasons why reduction of the debt will be desirable.

tion of the debt will be desirable.

In the first place, it will help prepase the country financially for a possible third World War. Determined as we are that this war ahall be the list ose, common sense tells us not to count on this. At any rate, we must be prepared for any eventuality.

must be prepared for any eventuality.

In the second place, gazdan (reduction of
the debt would stimulate engeloyment by
creating the expectation of lower tases. It is
not generally appreciated how much the
willingens of individuals and basisess concerns to peak success is affected by the probest ways to make individuals and enterpeies spend more freely is to convince them
that these will become a little lower, year by

Many people have difficulty in visualizing the day when there will be a substantial reduction in the burden of the national debt. And yet, if the country pursues wise economic policies, there is no reason why the debt burden should not be cut in half der-

ing the next progration The days of technological progress and comonic expansion are not over. They are, in fact, only well begun. During the Twenties, the national income in dollars of constant neurchasing power increased by well over 50 per cent. Between 1929 and 1939. it increased by less than 6 per cent. Perhans the rate of the Twenties cannot be maintained indefinitely but rejectific recertely and development work in industry are laving the foundation for very large advances in national income. Suppose that the national income increases 33 per cent in the first decade after fighting stops (say, honefully, 1945). 25 per cent in the next decade, and thereafter at the rate of 20 per cent a decade. In 1955, the national income (at present prices) would be about \$173 billion; in 1965, about \$216 billion; and in 1975, about \$257 bil. lion. By 1970, the burden of the debt would

be reduced by nearly half, even if not a cent

A brown public dobt is a test of the choracter, the common sense, the foresight, and the roughly important technical and engineering shill of a nation. It recruires there tens of millions of small income earners be willing to become substantial holders of the debt. It requires that the nation he willing to tax itself heavily, but in ways which increase the attractiveness of job. giving or self-employment relative to job-holding: It requires that the nation he willing to pursue policies of expansion and to put a rising income for the nation ahead of the pleas of nell-seeking groups in labor, agri-

culture, and industry.

A huge debt may so draw out the hadden powers of a people that it makes the nation wealthier rather than power, stronger rather than weaker.

Up to now, Americans have not met the

teef of a big public debt too well. Individual now soved more in each then in government bonds, and the country has above little in each of the country has above little in each of the country has above little in each of the country for laber. These destroyers have been comings. I am ance, stem largely from the fact that the American people never have und the problems of debt and tastation here eathy and adequately explained to them. Thave confidences in the American bave the intelligence to the contract of the confidence of the Particle propile.

I believe that Americans have the intelligence to undentand this problem of the public debt, the character to face their responsibility regarding it, and the common sense to accept the challenge and make the most of it.

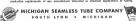




# Offers Production As Well As Structural Advantages

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VIATION, August, 1964

## Needle Bearings Aid Design Simplification







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TORRINGTON NEEDLE BEARINGS



TDRE studies show that with a CP Budiel two seconds - including locating and driffing Developed refresely for stock drilling CF other types of bench driffing. Available with either (0° or 72° reach. Two types of mount ings; No. 10 Arm, equipped with hole spetter. for continuous production drilling up to 5/16" at 10.500 r.n.m. - a mood made reserved to corepressed air fed oil to keep the drill bit cool and shares No. 11 Arm, for drilling up to 35%



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AUTATION, Asset, 1911

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No snot on earth is more then 40 hours' flying time from your local airport



AIRCRAFT



# Who's "ALL WET"?

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Bendix PRODUCTS DIV

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#### Realism and the Personal Plane Market

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Jesle E. Venlle



#### Teaching the First Helicopter Pilots

BY C. L. TURS' MORRIS

In a 'combo, some appropriated alone tection won't not you prewhere. But others—like patting your tail down for a landingcartainly will. For you'll obreatly take off harbourd! Just what also a "erese" man is un assisst is hability revealed here by "Les" Merris, who piencered the training at Wright Field.

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AVIATION, August, 1944.

#### THE ECONOMIC FUTURE OF AVIATION TECHNOLOGY

PART II

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by PREDERIC FLADER

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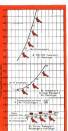


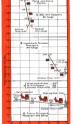
AVIATION, Aspect, 2846

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Where Are Those Marketina Plans?

By ADMIN M. FREDERICK, Parlane of Engagements & Admin'ts

Recounting the disconcertion experience of a potential distributor. this turns cose history throws down a pointed challenge to those mountainteers who will enter the past-victory light place field.

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COST STREET, ACCOUNTS AND DELLARS.

# Timben Bearings HELP LORD DYNAFOCAL ASSEMBLIES ISOLATE ENGINE VIBRATION

"In the Lord link-type Dynafocal suspensions," writes the manufacturer, "Turken Bearings are used because of their high load capacity, compact size and low friction."

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mounting rubber section on the opposite end."
Why not source yourself of all the many Timken
Tapered Roller Bearing advantages, not
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capacity, selivantility and freedom from free
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THE TIMEEN ROLLER BEARING COMPANY, CANTON 6, OHIO





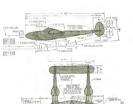
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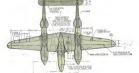
#### The Lockheed P-38 "Lightning"

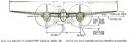
By HALL L. HIBBARD

One of the world's established triple-daily wreplanes — which serves as long recognished or low ellitheds fighter, herebor, or photo reconnectsomes creft — presented in Aris-Hea's assortioned style. Exvended here are details of the dering planearing design features which here readed to see the next conference ind well as accounted earthal plane.

AVEATION, Aspect, 1944

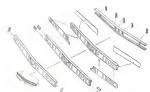






AVIATION, Aspect. 1944

AVIATION, Aspet, 1944



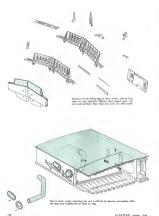
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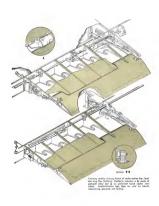


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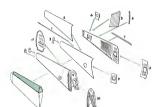
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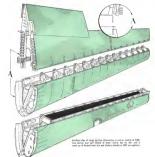
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AVIATION, Asput, 1946





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AVIATION, August, 1986 AVIATION



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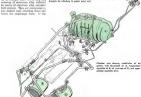
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ATIATION, August, 2044

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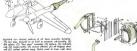
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ATTATION, Assess, 1944

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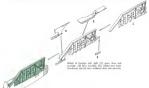
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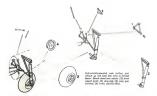
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AVIATION, Angust, 1544

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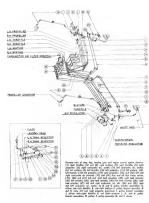
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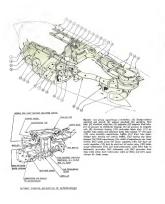
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## Boeina's New Wind Tunnel Accelerates Research

By WILLWOOD E BEALL You founded in Charm of Engineering Spaces Street Co.

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ATTATION, August, 1944

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ATLATION, Asput. 1944

# Takeoff Analysis For Flying Boats and Seaplanes



By ERNEST G. STOUT, Staff Lawrence in observe of Physical pages of Development,

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AVIATION, August, 1664

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- m + 28 24 C- ( - 006  $c_m = c_m + c_m + \frac{c_M}{c_m} \left( \frac{1}{m} - \frac{1}{n} \right)$ 

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# PLANT-PRACTICE HIGHLIGHTS





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## A Method for Calculatina Weights of New Flaps

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and load as an old design, this method is moderations to morreld. The two markeds should serve at a check on each other, within reservable It has been determined that the matotal of a flap resisting beating leads quantities of, (a) Upper and lower beam flames quadrated with the affective sine or each range, and (b) sparsell resi-torrespects and effective size. (Mappin)

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Symbols: M is beeded mount, # martin of section, a weight per cubic such of material, and a safes of bending ma-Should of East leading its shown in Plan

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trement, the following relation will be (Turn B star 277)

### Fan Coolina "Ups" Engine Performance 2407 U

By KENNETH CAMPBELL, June Parket James, Month Assessment Comthe year from tex = \$\frac{1}{2}, \frac{1}{2} \frac{1}{2} \frac{1}{2} Proceeding from theory to practice, the author discusses verteen

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ATTATION, Aspect, 1944



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In 1940 Dr. Frank Waterdorf and

# This Aircraft Heater Won't Blow Out

By ED. G. POWERS, Judeo Contactor Totals Clin

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Fig. 7 Monthwise principle of opposition. Seen not earlier at (13), Monthets conduction take (23) and Seet techniques (12), these is hearted and displaying (4) and distribution regions. Seen in a pressent through (4) into conduction deather (2) aspectably to content with Rips serious which you've pay required from (2) for force on arbitras. Supplif and seeks (4) (4) Monthet (24) and carryes seeks (12). Not considered great softs and (3) (4) Monthet (2) and carryes seeks (12). Not considered great softs and (4) (4) Monthet (2) and (4) are seeks (12) and (4).

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Fig. 2 Electrical clouds elapseum. Latt. will give plug cartie, with prelimetery right, with larter regulation.

ATTATION, Anguel, 1844

## Hole Piercing Proves Faster—and Cheaper

PART II

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AVIATION, Asput, 1846



#### ATTATION, August, 1964

# Load Characteristics Of Cellulose Acetate Plastic

PART III

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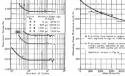


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Fig. 21. Effect of shops on time for freedow under conduct head



#### BACKING UP THE PILOT

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The skill and dering of cheer News Radio Guances is largely responsible for places and ships The success of a plane deneads not out-

on its crew, but on faultless engine per-

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More resease ablies miles to they with our other brand. Texaco Avantion Engineers will shalle

help you, too, secure increased engine tife at leading airports in the 48 Scases. The



# **EXACO** Lubricants and Fuels

FOR THE AVIATION INDUSTRY

#### THE IN THE TRACE STAR THAT IT SHELL HOST - ON . FOR VIN THE WAR BY STUDING SHITT DRIVE REPORTS AVIATION, Aures, 1644

## How to Look After Those Aerols

By FOWARD E. THORP

With teday's multi-has airplants hittian the response of up to 200 to not record the mechanism that absorbs the fall demands the hisbest type at caretal attention

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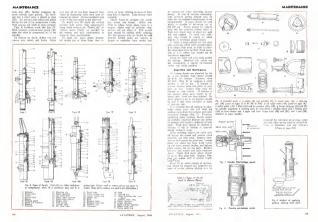






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AVIATION, August, 1944



MAINTENANCE MAINTENANCE

# At Hoosier Airport They LIKE Problems

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AVIATION, Assut, 1944







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AVIATION, ABOUT, 1944

THE SHEET SHOWS, IN PASSE

# AAF Devises All-Purpose Loosening Tool



AAF machinis demonstrates you of new server becomes



Striking tool with Semest, methods Samuel server in wing

# LONG LIFE For Your Wooden Props (8, 1 For Aprille April) (8, 1 For Aprille April) (8, 1 For Aprille April)

Good Raish . . . Squatness . . . Beleace. These qualities in a propeller keep yes fiying right. How to retain them in year wooden clearness is told in this artists.

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ATLATION, August 1866

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# Hot-Doping Problems Solved by New Plastic

By B. M. HATWICK Chall of Drive & Comment for Assesse Assess found. 30 necessary at helidanion time. This is the record runs



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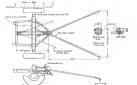


AVIATION, August, 1946

Hondy Airplane Tow Cor



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ATLATION, August 1944

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MAINTENANCE NOTEROOK



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#### MAINTENANCE NOTEROOK













#### SWA Bellds New Ring Grinder

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# Hew G.E. Pells Dowels

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ATIATION, August, 1946



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# . . . It Takes a Flight Engineer

By J. A. WAHLE and HUGH GOURDIN

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· ADDENDUM TO

# Graphic Solutions To Celestial Avigation

B. B. MATTEON COMPTON

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TION, Aspen, 1944





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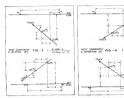
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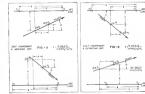


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# Air Schools Lay Pattern For Postwar Traffic Technique

By WILLIAM D. STROHMEIER, invisite, Herdinar Sales' of democrat Wide working experience is directing many handrads at airplans. Is and not of compact training fields has provided freewavely for addition, and the statements with places accordingly and the statements.

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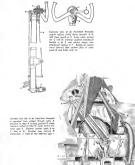
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By RAYMOND L. HOABLEY, Famile Cabe, "Assista"

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AVIATION Aspet, 2544



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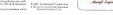
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LIBERTY AIRCRAFT MIRROR

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HARPANA SZAJE EBOS - PATRY - YERRE

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Aircraft Heater

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Hot-Doping

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ROUSTABOUT





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### WETORDRY Safety Walk Adhesine 613



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on wanty articles because it retained its hetrons beauty by molecules turnish. Not world an entered the new did "limit" characters elected become an important factor in the tool industry, for it was markly discovered that continue from 5002" to 45" thirk would

Most industrial coatings of chromities plate were found to have a value of 1000 Beinell with No. 9 position on the Mohe scale, sorts the dissected as No. 16. This excreme hardness was found to contact the sourier contains of handsood steel cases

That is why all Effection made gage blocks are chronition wheel on their stating surfaces—to save them recaring qualities that not be marked the life of the andiques hand steel blocks. the named near Pillaroom associateds will have 8 to 5 plants

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are pilot's sweet past, extense seas

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Pattern for Traffic (Continued from June 1989)

The same of factors recognise for safety

AVIATION, August, 1944





## FIGHTERS I speed, the fire is OUT.

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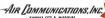
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MASS PRODUCTION OF SHEETS, RODS, TUBES, MOLDED FORMS, FABRICATED PARTS



The Cortis "Cerrier Piecon," on the left, and the Folker 1: carine monopless, on the right, were ACTED THE WAR rendered Buile Service jour before they make off on was used as for back as 1924 on solve of the most Per-America Good-Will Filers in 1926, and others



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Let SIMMONDS take over part of the Control Room Job

Constant to the trend or other substituted fields, the combine of commission and commiss treels on the record with the money and use of speciel. But you as compains conditions in other fields are been bundled suppractically, the Supprando-Hobson Associatic Engine



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Stangard in new producting a proving con-4. mot which relieves the pilot of constantly washing marafald pressure and adjaceing his moture. New models will soon curend savetrans Susmonds engineers will be glad to do-



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Engine economy comes first when considering how to keep planes in the sir. For. the time has arrived in civilian relation when come again assume importance, when savings must be realized. Kinner engines will somer the problem of low conpower, because Kitner has built economy into its engines for a quarter-century.

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Economy is important today-will be more important compressy. And it is in the romon row, when hours grow from hundreds to thousands, that Kinner economy will count HOIL KINNER MOTORS, INC.,









COURAGEO

h one word for the Zeobyr When equipped with the present Do.ALL Save Road, if evin the ways through pro-Prints southery, Firsts. 30" severe liffing toble, the Zephyr perpensions large cartner and the blacks or well as parts of unusual length.

Developed by the makers of the females DeALL Centeur Mechines for Toster, cleaner college and absolute of testands new materials, as well as

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# Mass-Trecision put this "shelved" idea to work

provided possibilities a used it was pur up to Nighols The starblers block Funding ways to penduce the space

to engineering this unit to man-precision resplicts. so well to occurre belonging and looking. And actornel quirement for light weight, high speed and low price...

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"Accurate" Nichols



# Karke-Uero HYDRAULIC COMPONENTS FOR MILITARY AIRCRAFT













One answers the Al Renewich "Stratalah " Daalread and bells for research on blok-altitude datas, its facilities are now devoted to millitary projects. But other the war, this right necessire chamber will again take on the venbleres of commercial fiving.





metamatic exit flan controls. Helytspright intoo, will return to meantime projects, helping turocolors anti-convention off coolers, Propa solve such problems so the ediptation for to merrow's finer sirliners of the new intercoaltheir "lenowheer" will come new heat transfer and pressure control systems, and AlBerrarch ing and oil cooling systems that AiBosearch "comfort-protection" for proceetime pircreft. has developed for planes of war.





ATTATION, Aspet, 1944



Federal Telephone and Radio Corporation



☐ UNBREAKABLE-Top place forged of SAX-1045 carbon steel with integral king bolr. Yoke has formed of SAE-1945 street with structural socie lega.

Heart or Tireken coller bearings. SERVICE CASTER A TRUCK DIVISION OF CASTER A TRUCK D

Asia and King Bolt 155" dismeter.

Wheels-cart read, certified malleable iron or moulded plantic type. Size of "wheels"—Senadord, 9" to 12" distractor.

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We hope you'll agree with this outline of our
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With aguale strength to handle musieven struck, excellent floubility and

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ATLATION, Answer, 1964



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ATTATION, Avenue, 1944

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IIC CLEANING TRADUCK PH CONTROL Mis. Plant in Los Avenue, Carpain, Petra Amery, September

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M. S. Bighards, assistant property AVIATION, Asset, 1944





Takes a Flight Engineer

the Bight. Scoond, the Fight restures.

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Remarker supplies sufficiency can be held in subone way - by precision methods - close uderances and close inspection. That's the accret of MURDOCK. pure or week connections - this is due to Mandack's molded construction. You see always nors of class prorption and permanently fee adjournment when you went

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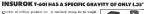
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AVEATION, August, 2044

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KOEHLER AIRCRAFT PRODUCTS COMPANY 814 Vermeel Ave. Deytes 4, Obio. Profess in America does you are 10. Not Case the Merica does the say in La August 2015.

# CONTROLLING THE POWER

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AVIATION, Asset, 1844

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Envisor Strates as P. W. ONAN

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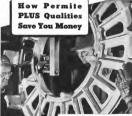


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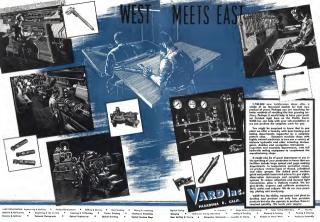
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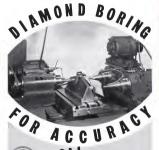
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(VIATION, August, 1941





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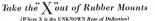
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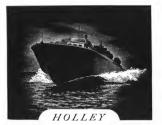




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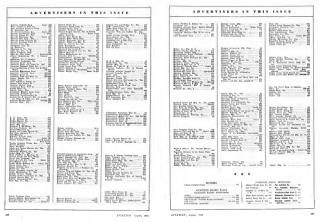
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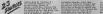
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